

CLAIMS

1. An information inputting tool comprising,
a reflection portion provided with a single or a plurality of reflection members
5 having retroreflectivity,
an attaching gadget that attaches said reflection portion to a finger of an operator,
and
a change mechanism that changes the reflectance distribution of said reflection
portion in accordance with a finger pressure applied to the finger end of said finger.
- 10 2. An information inputting tool according to claim 1, characterized in that
said change mechanism shields/releases at least a portion of said reflection portion.
3. An information inputting tool according to claim 2, comprising a plurality of
reflection members having retroreflectivity are provided side by side on said reflection
portion, and
15 said change mechanism shields/releases at least one reflection member of said plurality
of reflection members having retroreflectivity.
4. An information inputting tool according to claim 3, comprising a plurality of,
three or more reflection members having retroreflectivity are provided side by side on
said reflection portion, and
20 said change mechanism shields/releases at least one reflection member thereof having
retroreflectivity that is located between two or more reflection members having
retroreflectivity of said plurality of reflection members.
5. An information inputting tool according to any one of claims 1-4, characterized
in that
25 at least one of the reflection surfaces constituting said reflection member is a reflection
type diffractive optical surface that transforms, relative to the wavefront shape of the
incident light, the wavefront shape of the reflection light.
6. An information inputting tool according to any one of claims 1-5, characterized
in that
30 said reflection member also functions as an identification mark that indicates the kind
of said finger.
7. An information inputting tool according to any one of claims 1-6, characterized
in that
said reflection portion is provided with at least two kinds of corner-shaped reflection
35 surfaces whose postures are different from each other.
8. An information inputting tool according to claim 7, characterized in that

said reflection portion is provided with said at least two kinds of corner-shaped reflection surfaces having orientation angle difference θ that satisfies $0^\circ < 90^\circ$.

9. An information inputting tool according to any one of claims 1-8, characterized in that

5 said attaching gadget has a stopper mechanism that fixes said reflection portion to said finger of the operator and a release mechanism that releases said reflection portion from said finger of the operator.

10. A storage device comprising,
a storage pit that stores an information inputting tool according to claim 9,
10 means for driving said stopper mechanism of said information inputting tool,
and

means for driving said release mechanism of said information inputting tool.

11. A storage device comprising,
storage pits that individually store a plurality of information inputting tools
15 according to any one of claims 1-9 that are individually attached to each of a plurality of fingers of an operator and

detection means that individually detects whether each of said plurality of information inputting tools is stored.

12. A storage device according to claim 10 or 11, characterized in that it is provided
20 to a face following type display.

13. An information inputting device comprising,
an illumination optical system that illuminates with an illumination light the
hand region of an operator to which an information inputting tool according to any one
of claims 1-9 is attached,

25 an optical system that leads from said hand region of the operator the reflection light of said illumination light and forms an image of said reflection portion in a predetermined position, and

a two-dimensional light receiving device that images said image in the predetermined position.

30 14. An information processing equipment comprising,
a control portion that is applied to an information inputting device according to claim 13 and that recognizes, based on the position and the luminance distribution, of said image of said reflection portion, on said image acquired by said two-dimensional light receiving device, the finger end actions of said operator with the coordinates on
35 said two-dimensional light receiving device.

15. An information processing equipment according to claim 14, characterized in

that

said control portion recognizes, along with said finger end actions, the kind of said finger.

16. An information processing equipment according to claim 14 or 15, characterized in that

said control portion, at least, performs said recognition of said finger end actions by, after recognizing the position of said finger end, recognizing whether there is said finger pressure.

17. An information processing equipment according to any one of claims 14-16, characterized in that said control portion

displays on an outside or inside display a keyboard image indicating a key top layout of a keyboard device and, at the same time, while coordinate-transforming the position of said finger end on said two-dimensional light receiving device into the coordinates on said display, displays in real time on said display a finger end image indicating said finger end actions,

adopts a coordinate transformation that transforms the position of said finger end into reference coordinates on said display in a time period that ends when a predetermined signal is given from said operator, and

after said predetermined signal is given from said operator, adopts a coordinate transformation that transforms the position of said finger end at the timing when said signal is given into said reference coordinates on said display.

18. An information processing equipment according to claim 17, characterized in that

said control portion accepts, via said information inputting device, said predetermined signal from said operator.

19. An information processing equipment according to claim 17 or 18, characterized in that

said control portion displays a key, among said keyboard image, at least the position of which overlaps with said finger end image with a color different from that of the other keys.

20. An information processing equipment according to claim 19, characterized in that

said control portion changes the display color of said key at a timing when a finger pressure is applied to said finger end.

21. An information processing equipment according to any one of claims 17-20, characterized in that

in the display area displayed by said display is secured, in addition to a special field on which said keyboard image is to be displayed, a general field on which an image and/or a letter inputted from the outside are to be displayed, and

5 said control portion displays, when said finger end image is displayed on said general field, a pointer image of a pointing device at the position of the finger end, in addition to or instead of the finger end image.

22. An information processing equipment according to any one of claims 17-21, characterized in that said control portion, when it recognizes said finger end actions of a plurality of finger ends,

10 adopts for the coordinate transformation of the position of each finger end a coordinate transformation that transforms the position of a specified finger end into reference coordinates on said display in a time period that ends when a predetermined signal is given from said operator and

15 after said predetermined signal is given from said operator, adopts for the coordinate transformation of the position of each finger end a coordinate transformation by which the position of said specified finger end at the timing when said signal is given is transformed into said reference coordinates on said display.

23. An information processing equipment according to any one of claims 17-22, characterized in that said control portion, when it recognizes said finger end actions of
20 the right and left hands,

performs said coordinate transformations independently with respect to the right and left hands.

24. An information processing equipment comprising a control portion, said control portion being applied to an information inputting device that acquires information of the
25 right and left finger actions of an operator and processes the information, wherein said control portion

displays on an outside or inside display a keyboard image indicating a key top layout of a keyboard device and, at the same time, while coordinate-transforming the positions of each finger end on the right and left hand regions of said operator into the
30 coordinates on said display, displays in real time on said display finger end images indicating said finger end actions,

adopts, in a time period that ends when a predetermined signal is given from said operator, a coordinate transformation that transforms the position of a specified left finger end into left reference coordinates on said display for the coordinate
35 transformation of the position of each of said left finger ends and adopts, at the same time, a coordinate transformation that transforms the position of a specified right finger

end into right reference coordinates on said display for the coordinate transformation of the position of each of said right finger ends, and

after said predetermined signal is given from said operator, adopts for the coordinate transformation of the position of each of said left finger ends a coordinate transformation by which the position of said specified left finger end at the timing when said signal is given is transformed into said left reference coordinates on said display and adopts, at the same time, for the coordinate transformation of the position of each of said right finger ends a coordinate transformation by which the position of said specified right finger end at the timing when said signal is given is transformed into said right reference coordinates on said display.

25. A storage device comprising,
storage pits that individually store a plurality of information inputting tools that are individually attached to a plurality of fingers of an operator and
a detection means that individually detects whether each of said plurality of information inputting tools is stored.

26. A storage device according to claim 25, further comprising
means that attaches said information inputting devices to said fingers of the operator and
a means that detaches said information inputting devices from said fingers of the operator.

27. A storage device according to claim 25 or 26, characterized in that it is provided to a face following type display.